ABSTRACT

A method for performing pre-stack time migration of seismic data in a region where the subsurface seismic wave propagation velocity varies in both the vertical direction and a horizontal direction. The migration is performed in the wave number - frequency domain and involves using travel time maps to find a linear fitting of the migration phase shift for a given ray parameter and at a given vertical depth versus horizontal position. The slope and intercept parameters from the linear fit are used to adjust a known pre-stack time migration equation, with the accuracy of the linear approximation requiring mild horizontal velocity variation.